CLAIMS

(1) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

the second communication node's comparing an error detection code C generated by performing the prescribed error detection code operation on a received packet with an error detection code F1 contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C and F1 coincide with each other, comparing the error detection code C generated by performing the prescribed error detection code operation on the received packet with an error detection code F2 obtained by performing an inverse operation for returning a result of the prescribed operation to an original on the error detection code F1 contained in the FCS field of the received packet, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C and F2 coincide with each other.

(2) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

the second communication node's comparing an error detection code C generated by performing the prescribed error detection code operation on a received packet with an error detection code F1 contained in the FCS field of the received packet and an error detection code F2 obtained by performing an inverse operation for returning a result of the prescribed operation to an original on the error detection code F1 contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C and F1 coincide with each other, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C and F2 coincide with each other.

(3) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

the second communication node's comparing an error detection code C1 generated

by performing the prescribed error detection code operation on a received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, comparing an error detection code C2 obtained by performing the prescribed operation on the error detection code generated by performing the prescribed error detection code operation on the received packet with the error detection code F contained in the FCS field of the received packet, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(4) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

the second communication node's comparing an error detection code C1 generated by performing the prescribed error detection code operation on a received packet and an error detection code C2 obtained by performing the prescribed operation on the error detection code C1 with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, and performing reception processing on the received packet with an understanding that it is

classified as the second packet if the error detection codes C2 and F coincide with each other.

(5) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication node, a first packet containing, in the FCS field, an error detection code generated by performing a first error detection code operation on a transmission packet or a second packet containing, in the FCS field, an error detection code generated by performing a second error detection code operation on the transmission packet; and

the second communication node's comparing an error detection code C1 generated by performing the first error detection code operation on a received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, comparing an error detection code C2 generated by performing the second error detection code operation on the received packet with the error detection code F contained in the FCS field of the received packet, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(6) A packet communication method for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized by comprising the steps of:

a first communication node's selectively transmitting, to a second communication

node, a first packet containing, in the FCS field, an error detection code generated by performing a first error detection code operation on a transmission packet or a second packet containing, in the FCS field, an error detection code generated by performing a second error detection code operation on the transmission packet; and

the second communication node's comparing an error detection code C1 generated by performing the first error detection code operation on a received packet and an error detection code C2 generated by performing the second error detection code operation on the received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(7) The packet communication method according to any one of claims 1 to 4, characterized in that the prescribed operation to be performed on the first error detection code is at least one of reversing all bits of the first error detection code, reversing partial bits of the first error detection code, adding a prescribed value to the first error detection code, and subtracting a prescribed value from the first error detection code.

(8) The packet communication method according to claim 7, characterized in that two or more kinds of packets are generated as the second packet containing, in the FCS field, the second error detection code obtained by performing the prescribed operation on the first error detection code by combining prescribed operations and addition and subtraction of plural kinds of prescribed values, and three or more kinds of packets including the first packet are transmitted and received between the first and second communication nodes.

(9) The packet communication method according to claim 5 or 6, characterized in that the first error detection code operation and the second error detection code operation employ

different parameters to produce different error detection codes, and three or more kinds of packets containing, in the FCS fields, error detection codes generated by using three or more kinds of parameters, respectively, are transmitted and received between the first and second communication nodes.

(10) A packet communication method characterized in that three or more kinds of packets are generated by combining the kind of prescribed operation to be performed on the first error detection code recited in any one of claims 1 to 4 and the kinds of error detection code operations recited in claim 5 or 6, and are transmitted and received between the first and second communication nodes.

(11) The packet communication method according to any one of claims 1 to 10, characterized in:

that the first and second packets or the three or more kinds of packets are different from each other in frame format;

that the first communication node puts, into the FCS field of a packet to be transmitted, an error detection code generated by an operation corresponding to a frame format of the packet to be transmitted; and

that the second communication node recognizes a frame format of a received packet by performing an operation on an error detection code of the received packet, and performs reception processing on the received packet on the basis of the recognized frame format.

(12) The packet communication method according to claim 11, characterized in that the frame format corresponding to the error detection code is a prescribed, standard frame format or an unprescribed, special frame format.

(13) The packet communication method according to claim 12, characterized in that a data portion of a packet of the special frame format includes, together with fragments obtained by dividing a data frame or a plurality of data frames, a field containing information

that is necessary when the second communication node reconstructs a corresponding data frame from the data packet concerned.

(14) The packet communication method according to claim 13, characterized in that a plurality of data packets are generated by performing division, patching, or aggregation on the data frame or frames, and each of the data packets includes a field containing information that is necessary for reconstruction of a data frame.

(15) The packet communication method according to claim 14, characterized in that the plurality of data packets are transmitted parallel by using a plurality of radio channels, a single radio channel and SDM or MIMO, or a plurality of radio channels and SDM or MIMO.

(16) The packet communication method according to claim 15, characterized in that the plurality of data packets are generated so as to have the same packet time length defined as a time necessary for a transmission by adjusting a packet size ratio of the data packets in accordance with a transmission rate ratio of the radio channels.

(17) The packet communication method according to claim 12, characterized in that a packet of the special frame format includes a field containing control information of the communication node.

(18) The packet communication method according to claim 12, characterized in that a packet of the special frame format is provided with a field containing control information of the communication node when a packet of the standard frame format does not have a data portion.

(19) The packet communication method according to claim 12, characterized in that a packet of the special frame format is provided with a field containing transmission data of the communication node when a packet of the standard frame format does not have a data portion.

(20) The packet communication method according to claim 12, characterized in that a

packet of the special frame format has an unprescribed frame header.

(21) The packet communication method according to claim 17 or 18, characterized in that the control information is traffic information of the communication node.

(22) The packet communication method according to claim 17 or 18, characterized in that the control information is information that is necessary for handover processing of the communication node.

(23) The packet communication method according to claim 17 or 18, characterized in that the control information is a parameter that is necessary for connection of the communication node to a network.

(24) The packet communication method according to claim 17 or 18, characterized in that the control information is information that is necessary for change of a channel access procedure of the communication node.

(25) The packet communication method according to claim 17 or 18, characterized in that the control information is information that relates to a channel allocation time of the communication node.

(26) The packet communication method according to claim 17 or 18, characterized in that the control information is propagation path information, a transmission rate, or information relating to a transmission power control that is detected by the communication node.

(27) The packet communication method according to any one of claims 1 to 10, characterized in:

that the first and second packets or the three or more kinds of packets have error detection codes generated by operations that are different from each other so as to correspond to respective destinations;

that the first communication node puts, into the FCS field of a packet to be

transmitted, an error detection code generated by an operation corresponding to a destination of the packet to be transmitted; and

that the second communication node performs reception processing on a packet directed to itself that is recognized by performing an operation on an error detection code of a received packet.

(28) The packet communication method according to any one of claims 1 to 10, characterized in:

that the first and second packets or the three or more kinds of packets have error detection codes generated by operations that are different from each other so as to correspond to the respective kinds of packets;

that the first communication node puts, into the FCS field of a packet to be transmitted, an error detection code generated by an operation corresponding to a kind of the packet to be transmitted; and

that the second communication node performs reception processing on a packet of a kind that is recognized by performing an operation on an error detection code of a received packet.

(29) The packet communication method according to claim 28, characterized in that the kind of a packet is recognized by an identifier that is contained in the packet and indicates the kind of the packet, and error correction codes corresponding to the respective kinds of packets are used.

(30) The packet communication method according to claim 29, characterized in that when recognizing reception of a prescribed packet by performing an operation on an error detection code of a received packet, the second communication node performs reply processing to the received packet and manages the first communication node as a communication node capable of special processing.

(31) The packet communication method according to claim 29, characterized in that when recognizing reception of a prescribed packet by performing an operation on an error detection code of a received packet, the second communication node communicates information indicating presence of a communication node capable of special processing to an upper layer.

(32) The packet communication method according to claim 28, characterized in that the kind of a packet corresponds to information indicating an encryption key of an encrypted data packet, and error detection codes corresponding to respective encryption keys are used.

(33) A packet communication apparatus for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in:

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

that the second communication node comprises means for comparing an error detection code C generated by performing the prescribed error detection code operation on a received packet with an error detection code F1 contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C and F1 coincide with each other, comparing the error detection code C generated by performing the prescribed error detection code operation on the received packet with an error detection code F2 obtained by performing an inverse operation for returning a result of the prescribed operation to an original on the error detection code F1 contained in the FCS field of the received packet, and

performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C and F2 coincide with each other.

(34) A packet communication apparatus for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

that the second communication node comprises means for comparing an error detection code C generated by performing the prescribed error detection code operation on a received packet with an error detection code F1 contained in the FCS field of the received packet and an error detection code F2 obtained by performing an inverse operation for returning a result of the prescribed operation to an original on the error detection code F1 contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C and F1 coincide with each other, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C and F2 coincide with each other.

(35) A packet communication apparatus for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in:

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection

code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

that the second communication node comprises means for comparing an error detection code C1 generated by performing the prescribed error detection code operation on a received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, comparing an error detection code C2 obtained by performing the prescribed operation on the error detection code generated by performing the prescribed error detection code operation on the received packet with the error detection code F contained in the FCS field of the received packet, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(36) A packet communication apparatus for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in:

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, a first error detection code generated by performing a prescribed error detection code operation on a transmission packet or a second packet containing, in the FCS field, a second error detection code obtained by performing a prescribed operation on the first error detection code; and

that the second communication node comprises means for comparing an error detection code C1 generated by performing the prescribed error detection code operation on a received packet and an error detection code C2 obtained by performing the prescribed

operation on the error detection code C1 with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(37) A packet communication apparatus for transmitting, between a plurality of communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in:

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, an error detection code generated by performing a first error detection code operation on a transmission packet or a second packet containing, in the FCS field, an error detection code generated by performing a second error detection code operation on the transmission packet; and

that the second communication node comprises means for comparing an error detection code C1 generated by performing the first error detection code operation on a received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, comparing an error detection code C2 generated by performing the second error detection code operation on the received packet with the error detection code F contained in the FCS field of the received packet, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(38) A packet communication apparatus for transmitting, between a plurality of

communication nodes, a packet including a data field containing information to be transmitted and an FCS field containing an error detection code, characterized in:

that a first communication node comprises means for selectively transmitting, to a second communication node, a first packet containing, in the FCS field, an error detection code generated by performing a first error detection code operation on a transmission packet or a second packet containing, in the FCS field, an error detection code generated by performing a second error detection code operation on the transmission packet; and

that the second communication node comprises means for comparing an error detection code C1 generated by performing the first error detection code operation on a received packet and an error detection code C2 generated by performing the second error detection code operation on the received packet with an error detection code F contained in the FCS field of the received packet, performing reception processing on the received packet with an understanding that it is classified as the first packet if the error detection codes C1 and F coincide with each other, and performing reception processing on the received packet with an understanding that it is classified as the second packet if the error detection codes C2 and F coincide with each other.

(39) The packet communication apparatus according to any one of claims 33 to 36, characterized in that the prescribed operation to be performed on the first error detection code is at least one of reversing all bits of the first error detection code, reversing partial bits of the first error detection code, adding a prescribed value to the first error detection code, and subtracting a prescribed value from the first error detection code.

(40) The packet communication apparatus according to claim 39, characterized in that two or more kinds of packets are generated as the second packet containing, in the FCS field, the second error detection code obtained by performing the prescribed operation on the first error detection code by combining prescribed operations and addition and subtraction of

plural kinds of prescribed values, and three or more kinds of packets including the first packet are transmitted and received between the first and second communication nodes.

(41) The packet communication apparatus according to claim 37 or 38, characterized in that the first error detection code operation and the second error detection code operation employ different parameters to produce different error detection codes, and three or more kinds of packets containing, in the FCS fields, error detection codes generated by using three or more kinds of parameters, respectively, are transmitted and received between the first and second communication nodes.

(42) A packet communication apparatus characterized in that three or more kinds of packets are generated by combining the kind of prescribed operation recited in any one of claims 33 to 36 to be performed on the first error detection code and the kinds of error detection code operations recited in claim 37 or 38, and are transmitted and received between the first and second communication nodes.

(43) The packet communication apparatus according to any one of claims 33 to 42, characterized in:

that the first and second packets or the three or more kinds of packets are different from each other in frame format;

that the first communication node further comprises means for putting, into the FCS field of a packet to be transmitted, an error detection code generated by an operation corresponding to a frame format of the packet to be transmitted; and

that the second communication node further comprises means for recognizing a frame format of a received packet by performing an operation on an error detection code of the received packet, and for performing reception processing on the received packet on the basis of the recognized frame format.

(44) The packet communication apparatus according to claim 43, characterized by

further comprising means for generating, as the frame format corresponding to the error detection code, a prescribed, standard frame format or an unprescribed, special frame format.

(45) The packet communication apparatus according to claim 44, characterized by further comprising means for generating a packet of the special frame format that includes, in a data portion, together with fragments obtained by dividing a data frame or a plurality of data frames, a field containing information that is necessary when the second communication node reconstructs a corresponding data frame from the data packet concerned.

(46) The packet communication apparatus according to claim 45, characterized by further comprising means for generating a plurality of data packets by performing division, patching, or aggregation on the data frame or frames, and for generating a packet or packets in which each of the data packets includes a field containing information that is necessary for reconstruction of a data frame.

(47) The packet communication apparatus according to claim 46, characterized by further comprising means for parallel transmitting the plurality of data packets by using a plurality of radio channels, a single radio channel and SDM or MIMO, or a plurality of radio channels and SDM or MIMO.

(48) The packet communication apparatus according to claim 47, characterized by further comprising means for generating the plurality of data packets so that they have the same packet time length defined as a time necessary for a transmission by adjusting a packet size ratio of the data packets in accordance with a transmission rate ratio of the radio channels.

(49) The packet communication apparatus according to claim 44, characterized by further comprising means for generating, as a packet of the special frame format, a packet that includes a field containing control information of the communication node.

(50) The packet communication apparatus according to claim 44, characterized by further comprising means for generating, as a packet of the special frame format, a packet that is provided with a field containing control information of the communication node when a packet of the standard frame format does not have a data portion.

(51) The packet communication apparatus according to claim 44, characterized by further comprising means for generating, as a packet of the special frame format, a packet that is provided with a field containing transmission data of the communication node when a packet of the standard frame format does not have a data portion.

(52) The packet communication apparatus according to claim 44, characterized by further comprising means for generating, as a packet of the special frame format, a packet having an unprescribed frame header.

(53) The packet communication apparatus according to claim 45 or 50, characterized by further comprising means for measuring traffic information of the communication node and using it as the control information.

(54) The packet communication apparatus according to claim 49 or 50, characterized by further comprising means for using, as the control information, information that is necessary for handover processing of the communication node.

(55) The packet communication apparatus according to claim 49 or 50, characterized by further comprising means for using, as the control information, a parameter that is necessary for connection of the communication node to a network.

(56) The packet communication apparatus according to claim 49 or 50, characterized by further comprising means for using, as the control information, information that is necessary for change of a channel access procedure of the communication node.

(57) The packet communication apparatus according to claim 49 or 50, characterized by further comprising means for using, as the control information, information that relates to a

channel allocation time of the communication node.

(58) The packet communication apparatus according to claim 49 or 50, characterized by further comprising means for using, as the control information, propagation path information, a transmission rate, or information relating to a transmission power control that is detected by the communication node.

(59) The packet communication apparatus according to any one of claims 33 to 42, characterized in:

that the first and second packets or the three or more kinds of packets have error detection codes generated by operations that are different from each other so as to correspond to respective destinations;

that the first communication node further comprises means for putting, into the FCS field of a packet to be transmitted, an error detection code generated by an operation corresponding to a destination of the packet to be transmitted; and

that the second communication node further comprises means for performing reception processing on a packet directed to itself that is recognized by performing an operation on an error detection code of a received packet.

(60) The packet communication apparatus according to any one of claims 33 to 42, characterized in:

that the first and second packets or the three or more kinds of packets have error detection codes generated by operations that are different from each other so as to correspond to the respective kinds of packets;

that the first communication node further comprises means for putting, into the FCS field of a packet to be transmitted, an error detection code generated by an operation corresponding to a kind of the packet to be transmitted; and

that the second communication node further comprises means for performing

reception processing on a packet of a kind that is recognized by performing an operation on an error detection code of a received packet.

(61) The packet communication apparatus according to claim 60, characterized in that the kind of a packet is recognized by an identifier that is contained in the packet and indicates the kind of the packet, and characterized by further comprising means for using the error correction codes corresponding to the respective kinds of packets.

(62) The packet communication apparatus according to claim 61, characterized in that the second communication node further comprises means for performing reply processing to a received packet and managing the first communication node as a communication node capable of special processing when recognizing reception of a prescribed packet by performing an operation on an error detection code of the received packet.

(63) The packet communication apparatus according to claim 61, characterized in that the second communication node further comprises means for communicating information indicating presence of a communication node capable of special processing to an upper layer when recognizing reception of a prescribed packet by performing an operation on an error detection code of a received packet.

(64) The packet communication apparatus according to claim 60, characterized in that the kind of a packet corresponds to information indicating an encryption key of an encrypted data packet, and characterized by further comprising means for using error detection codes corresponding to respective encryption keys.